<div align="center"><u>REMARKS</u></div>

Claims 1, 3-7, 10-13, 16-18, and 20-25 are currently pending in the application. By this response, claims 1, 3, 7, 16, 18, and 25 are amended for the Examiner's consideration. Claims 2, 8, 9, 14, 15, 19, and 26-29 are canceled without prejudice or disclaimer. Support for the amendments can be found in the claims as originally filed and at paragraphs [0034] and [0036] of the instant published application No. 2005/0049992. No new matter has been added. Reconsideration of the rejected claims in view of the following remarks is respectfully requested.

Telephone Interview

Applicants thank the Examiner for the courtesy extended during an interview between Examiner Rayyan and Applicants' representative on May 31, 2007. In the interview, proposed amendments to the claims were discussed with respect to the applied art. No agreement was reached.

Amendments to the Claims

Applicants have amended claims 1, 10, 13, 15, 16, 22, 24, 25, 31, and 33 and cancelled claims 9, 11, 12, 21, and 23 from further consideration in this application. Applicants are not conceding in this application that those claims are not patentable over the art cited by the Examiner, as the present claim amendments and cancellations are only for facilitating expeditious prosecution of the allowable subject matter noted by the examiner. Applicants respectfully reserve the right to pursue these and other claims in one or more continuations and/or divisional patent applications.

35 U.S.C. §103 Rejections

Claims 1-6, 18 and 20-25 were rejected under 35 U.S.C. §103(a) for being unpatentable over U. S. Patent No. 5,752,025 issued to Shakib *et al.* ("SHAKIB") in view of U. S. Patent Application Publication No. 2002/0120617 issued to Yoshiyama *et al.* ("YOSHIYAMA"). Claims 7, 10-13 and 17 were rejected under 35 U.S.C. §103(a) for being unpatentable over SHAKIB in view of YOSHIYAMA and further in view of U. S. Patent Application Publication No. 2001/00156428 issued to Gajda *et al.* ("GAJDA"). Claim 19 was rejected under 35 U.S.C. §103(a) for being unpatentable over SHAKIB in view of YOSHIYAMA and further in view of U. S. Patent Application Publication No. 2003/0088739 issued to Wilkes *et al.* ("WILKES"). Claims 8-9 and 14-16 were rejected under 35 U.S.C. §103(a) for being unpatentable over SHAKIB in view of YOSHIYAMA and GAJDA, and further in view of WILKES. These rejections are respectfully traversed.

The Examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP §2142.

As previously discussed, the present invention generally relates to optimization of database performance, and more particularly, optimization of performance in non-relational databases. In non-limiting exemplary implementations of the invention, a server provides database access and management control to a non-relational database. The server accepts

database inquiries from one or more clients and accesses the database accordingly and returns the results of the inquiry. By reducing the view index size, implementations of the invention may increase efficiencies in processing time, bandwidth and/or memory management.

More specifically, in non-limiting implementations of the invention, at least one view of the database is created by defining columns. The view index size is kept at a level that optimizes database performance by categorizing and sorting only a first subset of the columns contained within the corresponding view. The remaining columns of the view constitute a second subset and are marked as having been indexed, but are not actually used to build the index. The second subset of columns may be visible as collapsed data to a client for issuing a query, since all columns are marked as indexed. When a query is performed on at least one column of the second subset, a sort and categorization of the at least one column is performed. This results in some data being indexed at run time. However, since the second subset of columns are not initially indexed, the total number of indexed records is substantially less, the view index size is reduced, and overall performance is increased.

Claims 1-6, 18 and 20-25 in view of SHAKIB and YOSHIYAMA

As amended, independent claims 1, 18, and 25 each recite the database is a non-relational database. The Examiner acknowledges that SHAKIB and YOSHIYAMA do not disclose or suggest a non-relational database (Office Action, pages 8-9).

Additionally, independent claims 1, 18, and 25 each recite the sorting and categorizing includes assigning the first set of columns to a portion of a cache. The Examiner acknowledges that SHAKIB and YOSHIYAMA do not teach the use of a cache (Office Action, pages 11-12).

Moreover, independent claims 1, 18, and 25 each recite the second set of columns is visible as collapsed data, which, as discussed in greater detail below, is not disclosed or suggest by either SHAKIB or YOSHIYAMA.

Therefore, no proper combination of SHAKIB and YOSHIYAMA discloses or suggests all of the features of the claimed invention. Accordingly, for at least these reasons alone, the rejection of claims 1, 18, and 25 in view of SHAKIB and YOSHIYAMA should be withdrawn. Moreover, as claims 3-6 and 20-24 depend from claims 1 and 18, respectively, the rejection of these claims in view of SHAKIB and YOSHIYAMA should also be withdrawn. Also, claim 2 has been canceled, thereby rendering the rejection of claim 2 moot.

Accordingly, Applicants respectfully request that the rejection of claims 1-6, 18 and 20-25 be withdrawn.

Claims 7, 10-13 and 17 in view of SHAKIB, Yosiyama, and GAJDA

As amended, independent claim 7 recites maintaining the first set of columns in a portion of cache, and maintaining the at least one column of the second set of columns in another portion of cache. The Examiner acknowledges that SHAKIB, YOSHIYAMA, and GAJDA do not disclose or suggest maintaining columns in a cache (Office Action, pages 11-12).

Moreover, independent claim 7 recites the second set of columns is visible as collapsed data, which is not disclosed or suggest by SHAKIB, YOSHIYAMA, or GAJDA.

Therefore, no proper combination of SHAKIB, YOSHIYAMA, and GAJDA discloses or suggests all of the features of the claimed invention. Accordingly, for at least this reason alone, the rejection of claim 7 in view of SHAKIB, YOSHIYAMA, and GAJDA should be withdrawn.

Moreover, as claims 10-13 and 17 depend from claim 7, the rejection of these claims in view of

SHAKIB, YOSHIYAMA, and GAJDA should also be withdrawn.

Accordingly, Applicants respectfully request that the rejection of claims 7, 10-13 and 17

be withdrawn.

Claim 19 in view of SHAKIB, Yosiyama, and WILKES

Claim 19 is canceled by this amendment, thereby rendering the rejection of claim 19

moot. Accordingly, Applicants respectfully request that the rejection of claim 19 be withdrawn.

Claims 8-9 and 14-16 in view of SHAKIB, Yosiyama, GAJDA, and WILKES

Claims 8, 9, 14, and 15 are canceled by this amendment, thereby rendering the rejection

of these claims moot.

Claim 16 depends from claim 7, which recites, *inter alia*, the second set of columns is

visible as collapsed data. Applicants submit, for reasons discussed in greater detail below, no

proper combination of the applied art discloses or suggests the combination of features required

by claim 16, including the second set of columns is visible as collapsed data.

Accordingly, Applicants respectfully request that the rejection of claim 8, 9, and 14-16 be

withdrawn.

Response to Rejections made in Current Office Action

While the above discussion distinguishes the claimed invention from the pending

rejections, Applicants take this opportunity to rebut certain assertions made by the Examiner in

the current Office Action. For the reasons discussed below, Applicants submit that no proper

combination of the applied art discloses or suggests all of the features of the pending claims.

> **(i) YOSHIYAMA does not disclose or suggest: marking a second set of**
> **columns within the view as if the second set of columns were already**
> **sorted and categorized prior to actual sorting and categorizing of the**
> **second set of columns**

Each of independent claims 1, 7, 18, and 25 recites, generally speaking, marking a second

set of columns within the view as if the second set of columns were already sorted and

categorized prior to actual sorting and categorizing of the second set of columns. More

specifically, claim 1 recites *marking a second set of columns within the view as if the second set*

of columns were already sorted and categorized prior to actual sorting and categorizing of the

second set of columns; claim 7 recites *marking a second set of columns within the view as if the*

second set of columns were already sorted and categorized prior to actual sorting and

categorizing of the second set of columns; claim 18 recites *a component to mark a second set of*

columns within the view, wherein the second set of columns comprises all columns within the

view that are not in the first set of columns, and wherein the mark indicates that sorting and

categorizing has been performed on the second set of columns without actually having

performed the sorting and the categorizing; and, claim 25 recites *a second computer program*

code to mark a second set of columns within the view, wherein the second set of columns

comprises all columns within the view that are not in the first set of columns, and wherein the

mark indicates that sorting and categorizing has been performed on the second set of columns

without actually having performed the sorting and the categorizing. These features are not

shown or suggested by the applied references.

The Examiner asserts that SHAKIB discloses sorting and categorizing a first set of

columns within a view of a database. The Examiner acknowledges, and Applicants agree, that

SHAKIB does not disclose or suggest marking a second set of columns within the view as if the second set of columns were already sorted and categorized prior to actual sorting and categorizing of the second set of columns, the second set of columns including all columns exclusive of the first set of columns. The Examiner, however, asserts that YOSHIYAMA teaches these features at paragraph [0035], and that it would have been obvious to modify SHAKIB by adding these features. Applicants respectfully disagree and submit that no proper combination of the applied references teaches or suggests this feature of the claimed invention.

SHAKIB discloses a method and system for creating and displaying a table of categorized data. The table, called a categorization table, is analogous to the well-known computer directory tree structure with expandable and collapsible headings (FIG. 3). More specifically, a plurality of data records 10 are accessed through a sorted index 12. A header table 14 references the plurality of data records 10 through the sorted index 12 (FIG. 1). The sorted index 12 contains a separate entry corresponding to each data record contained in the plurality of data records 10. The header table is traversed to create and display a categorization table on a display means (FIG. 3). SHAKIB does not, however, teach or suggest marking a second set of columns within a view of a database as if the second set of columns were already sorted and categorized prior to actual sorting and categorizing of the second set of columns. The Examiner correctly acknowledges as much.

YOSHIYAMA does not cure the above-noted deficiencies of SHAKIB. YOSHIYAMA discloses a database retrieval method that is based upon a comparison of costs of different retrieval techniques. The method is useful for irregular retrievals where an already generated index cannot be used in many cases. In the method, a structured query language (SQL) statement (i.e., query) is parsed (see paragraphs [0046] and [0058]; and FIG. 5). Based upon the

parsing, a cost calculation is performed to determine the fastest way to access the database (see

para. [0059]). The costs of three retrieval techniques are calculated: (i) access made by entire

scanning on all of the data in the database; (ii) access made by using an already existing index or

dynamic index; and (iii) access made by creating and using a dynamic index (see para. [0063]).

The technique that is deemed the fastest is used to actually access the database and retrieve the

data in response to the query (see para. [0063] – [0066]).

Applicants respectfully submit, though, that the Examiner is simply not correct that

paragraph [0035] of YOSHIYAMA teaches the subject matter acknowledged to be missing from

SHAKIB. Paragraph [0035] of YOSHIYAMA explains the following:

> [0035] With this program, a step of making a comparison between a cost required
> when retrieval is performed after an index corresponding to a retrieval condition
> is generated and a cost required when entire retrieval is performed is first
> executed in a block 1 of FIG. 1. Next, in a block 2, a step of determining whether
> or not an index that satisfies a retrieval condition and is applicable exists among
> already generated indexes is executed, if the cost required when the entire
> retrieval is performed is higher as a result of the cost comparison made in the
> block 1. In a block 3, a step of generating an index corresponding to the retrieval
> condition is executed if an applicable index is determined not to exist in the block
> 2. In a block 4, a step of retrieving a database by using the index generated in the
> block 3 is executed. These steps are executed by a computer.

While it is true that the above-noted language discusses retrieving a database and

generating an index, there is no mention of marking a second set of columns within a view of a

database as if the second set of columns were already sorted and categorized prior to actual

sorting and categorizing of the second set of columns as required by the claimed invention.

Indeed, the terms "marking" and "view" are no where to be found in the noted passage. Nor has

the Examiner identified any features in YOSHIYAMA which the Examiner believes to be

equivalent.

Applicants emphasize that YOSHIYAMA does not explicitly disclose a view of a database. Instead, YOSHIYAMA only teaches that non-indexed data may be accessed in one of three ways: by a full scan, by using portions of existing indexes, or by creating a new dynamic index. However, there is simply no mention of marking a second set of columns as categorized and sorted before they are actually categorized and sorted.

On pages 2 and 3 of the Office Action, the Examiner asserts that "not indexing" is similar to marking and/or that "not indexing" is marking by default, and that YOSHIYAMA therefore teaches the recited marking. First Applicants note that "similar" and "by default" are not the standards for determining patentability. Instead, the applied references must explicitly or impliedly disclose or suggest each and every feature of the claimed invention. Being similar is not sufficient for a rejection under §103.

Furthermore, Applicants submit that the assertion "[n]ot indexing is similar to the applicant's claimed marking. Not indexing is marking by default" amounts to an assertion of inherency, even though the Examiner fails to explicitly identify it as such. Applicants respectfully traverse the Examiner's assertion of inherency. MPEP §2112 provides the following guidance regarding rejections based upon inherency:

> The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993) (reversed rejection because inherency was based on what would result due to optimization of conditions, not what was necessarily present in the prior art); *In re Oelrich*, 666 F.2d 578, 581-82, 212 USPQ 323, 326 (CCPA 1981). To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not

sufficient.' *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949,
1950-51 (Fed. Cir. 1999).
…
"In relying upon the theory of inherency, the examiner must provide
a basis in fact and/or technical reasoning to reasonably support the
determination that the allegedly inherent characteristic <u>necessarily</u>
flows from the teachings of the applied prior art." *Ex parte Levy,* 17
USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in
original)

Applicants respectfully submit that the Examiner's proffered reasoning that "[n]ot indexing

is similar to the applicant's claimed marking. Not indexing is marking by default" is mere

speculation, without any basis in fact or technical reasoning, as required by MPEP §2112.

Accordingly, <u>Applicants respectfully request that the Examiner provide factual support and</u>

<u>technical reasoning to support the determination that</u>

> [n]ot indexing is similar to the applicant's claimed marking. Not
> indexing is marking by default

<u>necessarily discloses or suggests the claimed feature of</u>

> marking a second set of columns within the view as if the second
> set of columns were already sorted and categorized prior to actual
> sorting and categorizing of the second set of columns.

Applicants emphasize that YOSHIYAMA provides no suggestion whatsoever of marking

a second set of columns within a view of a database as if the second set were already sorted and

categorized prior to actually sorting and categorizing the second set of columns, and the

Examiner has not demonstrated otherwise.

(ii) There is no proper motivation for modifying SHAKIB as suggested by the Examiner

Even assuming *arguendo* that YOSHIYAMA does disclose the above-noted features,

which Applicants dispute, there is no proper motivation for modifying SHAKIB with such

features. SHAKIB is directed to a method of displaying all of the data contained in a plurality of

data records. The data is displayed in a categorization table that may have expanded or collapsed

headings. All of the data in the data records or sort index is necessarily categorized and sorted

before it can be displayed (col. 6, lines 33-35). Since SHAKIB is concerned with displaying all

of the data, there would be no motivation to leave some of the data un-categorized and un-sorted.

Therefore, there would be no motivation to mark a subset of columns categorized and sorted

before they are actually categorized and sorted.

(iii) There is no reasonable expectation of success for modifying SHAKIB in view of YOSHIYAMA as suggested by the Examiner

Furthermore, and contrary to the Examiner's assertion, there is no reasonable expectation

of success that modifying SHAKIB with such features would "speed up data retrieval" in

SHAKIB. In fact, SHAKIB is not directed toward data retrieval in the same sense as

YOSHIYAMA. Instead, SHAKIB is directed toward the creation and display of a categorization

table that may have expanded or collapsed headings (see FIG. 3). YOSHIYAMA, on the other

hand, is directed toward a database management system (DBMS) and the selective retrieval of

data from a database based upon SQL statements (i.e., queries). SHAKIB makes no mention

whatsoever of a DBMS or queries. Therefore, the motivation proffered by the Examiner is

inapposite to SHAKIB, and there is no reasonable expectation of success of the proposed

modification of SHAKIB.

(iv) The proposed modification of SHAKIB in view of YOSHIYAMA is based on impermissible hindsight reasoning

Applicants submit that the Examiner has provided only conclusions of obviousness and

neglects to set forth any prior art basis for modifying the teachings of SHAKIB. In establishing a

prima facie case of obviousness under 35 U.S.C. § 103, it is incumbent upon the Examiner to

provide a reason why one of ordinary skill in the art would have found it obvious to modify a

prior art reference or to combine reference teachings to arrive at the claimed invention. See Ex

parte Clapp, 227 USPQ 972 (B.P.A.I. 1985) To this end, the requisite motivation must stem

from some teaching, suggestion or inference in the prior art as a whole or from the knowledge

generally available to one of ordinary skill in the art and not from Applicants' disclosure. See,

for example, *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 5 USPQ2d 1434 (Fed. Cir.

1988). As noted above, the applied documents are silent with regard to a number of recited

features and relate to database systems which functions in a different manner. Moreover,

YOSHIYAMA does not teach or suggest modifying the structure or operation of SHAKIB in the

manner asserted by the Examiner.

      Because the art of record fails to provide any reasonable explanation why one ordinarily

skilled in the art would utilize such an arrangement, and/or fails to disclose or suggest the

problems that such an arrangement would address, Applicants submit that the art of record fails

to provide the requisite motivation or rationale as to *why* one ordinarily skilled in the art would

modify SHAKIB to include features of the invention in the manner asserted by the Examiner.

That is, Applicants submit that because the Examiner has not set forth any basis or reason found

in the art of record for modifying SHAKIB, the instant rejection has no basis in the art of record,

such that the rejection is improper and should be withdrawn.

      Rejections based on 35 U.S.C. § 103 must rest on a factual basis with these facts being

interpreted without hindsight reconstruction of the invention from the prior art. The Examiner

has the initial duty of supplying the factual basis for the rejection and may not, because of doubt

that the invention is patentable, resort to speculation, unfounded assumption or hindsight

reconstruction to supply deficiencies in the factual basis. *See In re Warner*, 379 F.2d 1011,

1017, 154 USPQ 173, 177 (CCPA 1967). As stated in *W.L. Gore & Associates, Inc. v. Garlock,*

Inc., 721 F.2d 1540, 1553, 220 USPQ 303, 312-313 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851

(1984):

> [t]o imbue one of ordinary skill in the art with knowledge of the invention in suit,
> when no prior art reference or references of record convey or suggest that
> knowledge, is to fall victim to the insidious effect of a hindsight syndrome
> wherein that which only the inventor taught is used against its teacher.

Applicants submit that the only reason to modify the teachings of the applied reference in

the manner proposed by the Examiner is the result of a review of Applicants' disclosure and the

application of impermissible hindsight.

(v) The proposed modification of SHAKIB in view of YOSHIYAMA and GAJDA is improper and has no reasonable expectation of success

All of the independent claims 1, 7, 18, and 25 recite that the database is a non-relational

database. The Examiner acknowledges that SHAKIB and YOSHIYAMA do not teach or

suggest the use of a non-relational database. The Examine, however, asserts that GAJDA

teaches a non-relational database, and that it would have been obvious to further modify

SHAKIB and YOSHIYAMA in view of the teachings of GAJDA.

Applicants respectfully disagree and submit that no proper combination of these

references teaches or suggests all of the features of the claimed invention. Applicants

acknowledge that GAJDA discloses a system that improves access to non-relational database.

However, because YOSHIYAMA explicitly relates to a <u>relational</u> database (see para. 0002),

those skilled in the art would not replace the <u>relational</u> database with the <u>non-relational</u> database

of GAJDA. In fact, Applicants submit that it would be impossible to modify a non-relational

database with the relational database features of YOSHIYAMA, as proposed by the Examiner.

Those having ordinary skill in the art will recognize that such a modification simply will not

work. Thus, the rejection based upon SHAKIB, YOSHIYAMA, and GAJDA is improper and

should be withdrawn.

(vi) The applied art does not disclose or suggest the second set of columns is visible as collapsed data

By this response, independent claims 1, 7, 18, and 25 are all amended to recite that the second set of columns (which is marked as sorted and categorized but not actually sorted and categorized) is visible as collapsed data. In exemplary embodiments of the invention, at least one view of a database is created by defining columns. The view index size is kept at a level that optimizes database performance by categorizing and sorting only a first set of the columns contained within the corresponding view. The remaining columns of the view constitute a second set and are marked as having been indexed (i.e., sorted and categorized), but are not actually used to build the index (i.e., are not actually sorted and categorized). The second set of columns may be visible as collapsed data to a client for issuing a query, however, since all columns are marked as indexed. When a query is performed on at least one column of the second set, a sort and categorization of the at least one column is performed. This results in some data being indexed at run time. However, since the second set of columns are not initially indexed, the total number of indexed records is substantially less, the view index size is reduced, and overall performance is increased.

No combination of SHAKIB, YOSHIYAMA, GAJDA, and WILKES discloses or suggests second set of columns (which is marked as sorted and categorized, but is not actually sorted and categorized) is visible as collapsed data. Therefore, for at least this reason alone, the claimed invention is distinguishable from the applied art and the rejections should be withdrawn.

CONCLUSION

In view of the foregoing amendments and remarks, Applicants submit that all of the

claims are patentably distinct from the prior art of record and are in condition for allowance. The

Examiner is respectfully requested to pass the above application to issue. The Examiner is

invited to contact the undersigned at the telephone number listed below, if needed. Applicants

hereby make a written conditional petition for extension of time, if required. Please charge any

deficiencies in fees and credit any overpayment of fees to Attorney's Deposit Account No. 09-

0457.

Respectfully submitted,
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